J AND K WATER CORP. (PWS # 7100044)
SOURCE WATER ASSESSMENT FINAL REPORT

October 17, 2001

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the J and K Water Corp.*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The J and K Water Corp. drinking water system (PWS # 7100044) consists of three ground water sources. The inorganic contaminants (IOCs) fluoride, and arsenic have been detected at levels below the Maximum Contaminant Levels (MCLs). Levels of the IOC nitrate are consistently below 2.1 milligrams per liter (mg/L) in the well water. No synthetic organic contaminants (SOCs), volatile organic contaminants (VOCs), or microbial contaminants have been detected in the three J and K Water Corp. wells.

The delineated source water assessment areas for wells #2 and #3 encompass a slightly different area than the delineated source water assessment area for well #1. All three corridors extend northeast to the Snake River. The hydrologic sensitivity of the aquifer is high due to the fractured basalt, shallow ground water level, and lack of retarding layers between basalt flows. The total susceptibility score depends on the hydrologic sensitivity, which is high for the three wells, the potential land use assessment, which is high to moderate for the three wells, and the system construction score which was moderate to high for the three wells. In terms of total susceptibility, all three wells rate high for IOC, VOC, SOC, and microbial contaminants. The exception is that Well #2 rates moderate for VOCs. Wells #1 and #2 rate automatically high for susceptibility to IOCs and microbial contamination due to the presence of grazing animals within 50 feet of the wells.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the J and K Water Corp., source water protection activities should first focus on correcting deficiencies, if any still exist, outlined in the Sanitary Survey. The J and K Water Corp. should attempt to obtain control of the areas within a 50-foot radius of wells #1 and #2 and install a fence around the well #1 lot. Any spills from the potential contaminant sources listed in Appendix A should be carefully monitored, as should any future development in the delineated source water assessment areas. Since the sources show a connection with the Snake River, any major contamination of the river from one-time events or floods should be monitored. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Since most of the designated areas are outside the direct jurisdiction of the J and K

Water Corp partnerships with state and local agencies and industry groups should be established. These collaboration efforts are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation borders a large urban area. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineations, the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE J AND K WATER CORP., IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The J and K Water Corp. public drinking water system consists of three ground water sources. The system serves approximately 370 people with about 100 connections, and is located in Bonneville County (Figure 1).

There are no serious water quality issues currently facing the system. The IOC arsenic was detected in a water sample collected from the system manifold in September 2000 at a concentration of 0.006 mg/L, well below the current MCL of 0.05 mg/L. The Safe Drinking Water Act requires the EPA to revise the current MCL for arsenic. In January 2001, EPA published a new standard for arsenic in drinking water that requires public water supplies to reduce arsenic to 0.01 mg/L by 2006. EPA is reviewing this standard so that communities that need to reduce arsenic in drinking water can proceed with confidence that the new standard is based on sound science and accurate cost estimates.

The IOC fluoride was detected in a water sample collected from the system manifold in December, 1995 at a concentration of 0.37 mg/L, well below the current MCL of 4.0 mg/L. From September 1993 to September 2000, nitrate was detected in seven water samples collected from the system manifold at concentrations ranging from 1.31 mg/L to 2.08 mg/L. No VOCs, SOCs, or microbial contaminants were detected in water samples collected from the well manifold.

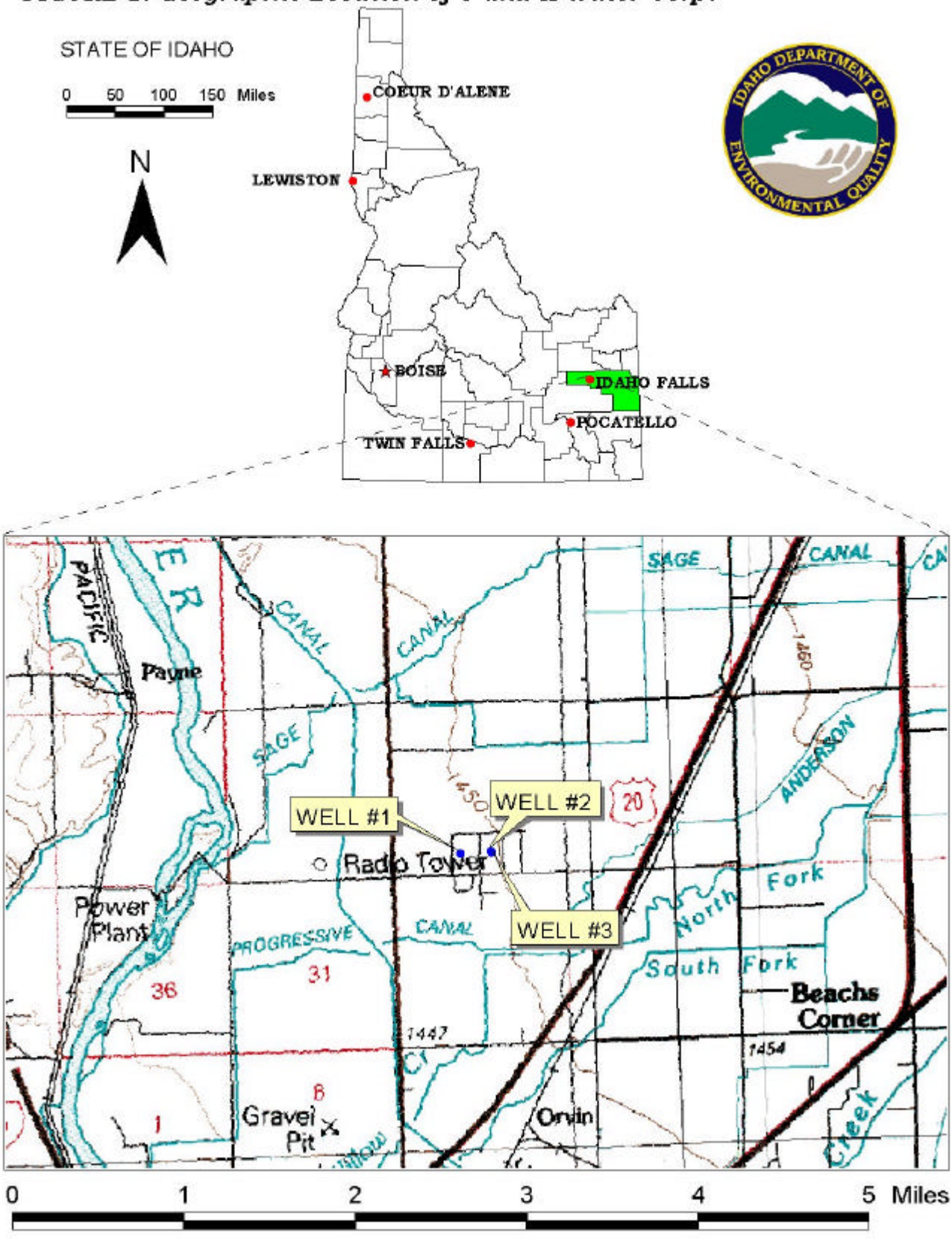
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using the refined computer model, Wellhead Analytical Element Model (WHAEM) approved by the EPA in determining the source water assessment area for PWSs associated with the Eastern Snake River Plain (ESRP) aquifer in the vicinity of the J and K Water Corp. The computer model used site-specific data, assimilated by WGI from a variety of sources including local area well logs, information provided by the operator, and hydrogeologic reports (detailed below).

The Eastern Snake River Plain (ESRP) is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lake sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bounded on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the Snake River. Rivers entering from the north vanish into the basalts of the Snake River Plain aquifer.

FIGURE 1. Geographic Location of J and K Water Corp.



The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gallons per minute (gpm) are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Ground water flow direction at the local scale is thought to be highly variable due to preferential flow paths through the fractured and layered basalts.

The delineated source water assessment area for the three J and K Water Corp. wells can best be described as corridors 0.25-miles wide around the wellhead to 1.6 miles wide at the furthest extent of the delineation, 15 miles to the northeast. The delineated capture zone runs into the Snake River within the 3-year time of travel (TOT) zone. Since the 3-year time of travel runs into the Snake River, WHAEM cannot compute the 6-year and 10-year TOT zones. The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the J and K Water Corp. is irrigated agricultural land. Land use within the immediate area of the wells consists of residences, animal grazing, some commercial uses, two major transportation corridors (Highway 20/191 and the Union Pacific Railroad), and various irrigation canals.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the <u>potential</u> for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted from May to June of 2001. This involved identifying and documenting potential contaminant sources within the J and K Water Corp. Source Water Assessment Areas through the use of computer databases and Geographic Information System maps developed by DEQ.

Since the delineation for well #1 differs from the delineation for wells #2 and #3, the potential contaminant sites located within the delineated source water areas differ slightly. Descriptions of the sites are found in Tables 1 and 2 and the locations relative to the sources are depicted in Figures 2 through 4. The delineated source water assessment area for well #1 contains nine potential contaminant sites. These sites include underground storage tank (UST) sites, dairies, businesses and industries that use chemicals, two major transportation corridors, and the Snake River. The delineated source water assessment areas for wells #2 and #3 contain ten potential contaminant sites. These sites include underground storage tank (UST) sites, dairies, businesses and industries that use chemicals, an unused recharge well, two major transportation corridors, and the Snake River.

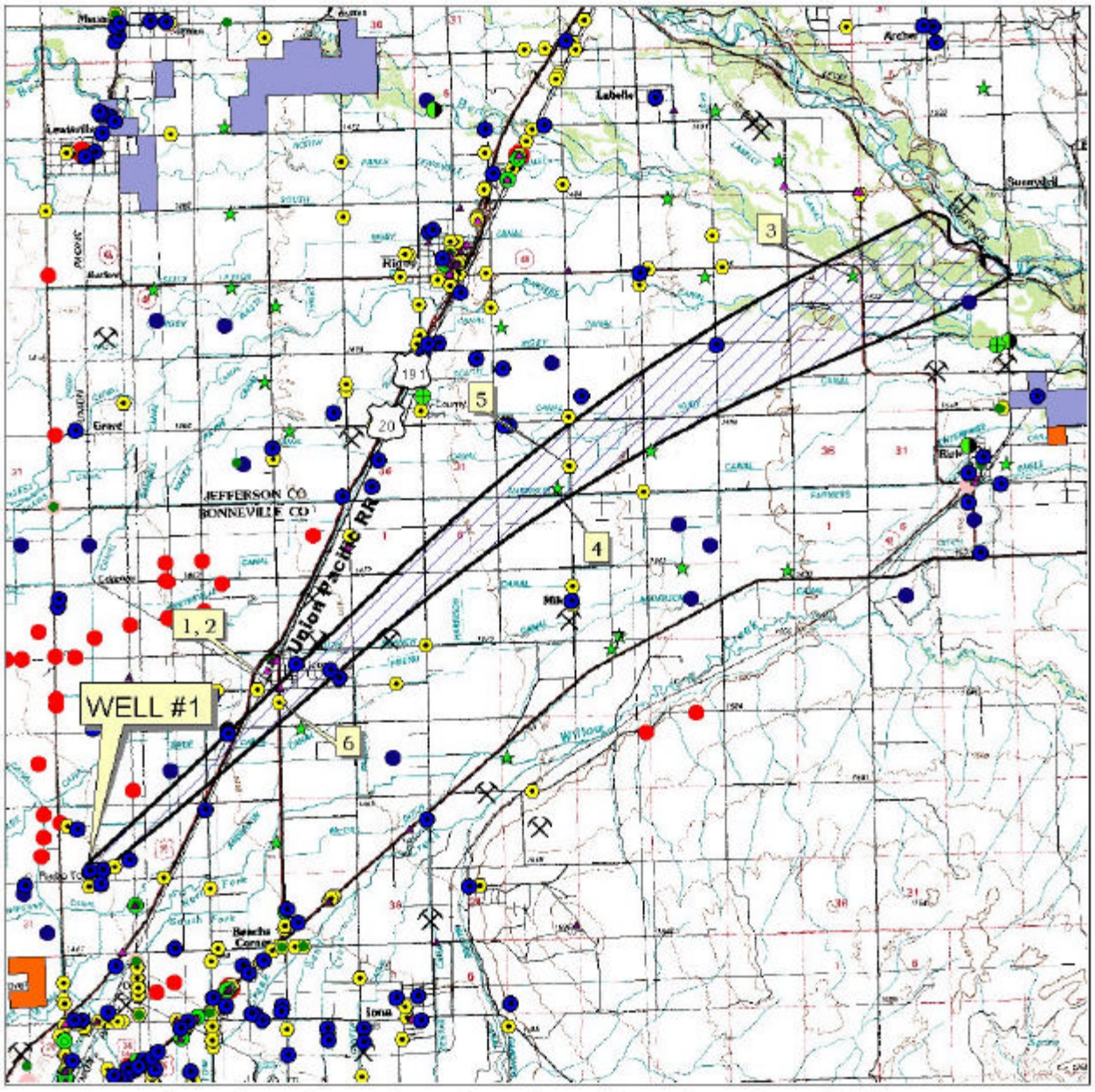
There are also numerous irrigation canals that cross the delineations. If an accidental spill occurred in any of the transportation corridors, the Snake River, or the irrigation canals, IOCs, VOCs, SOCs, or microbial contaminants could be added to the aquifer system due to the fractured nature of the basalt aquifer.

Table 1. J and K Water Corp. Well #1, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST – open	0-3	Database Search	VOC, SOC
2	UST – open	0-3	Database Search	VOC, SOC
3	Dairy <=200 cows	0-3	Database Search	IOC, Microbes
4	Dairy <=200 cows	0-3	Database Search	IOC, Microbes
5	Mobile Homes-Transporting	0-3	Database Search	IOC, VOC, SOC
6	Truck-Dealers-Used	0-3	Database Search	IOC, VOC, SOC
	Highway 20	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3-10	GIS Map	IOC, VOC, SOC

[1] UST = underground storage tank
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 2. J and K Water Corp. Delineation Map and Potential Contaminant Source Locations



PWS# 7100044
WELL #1

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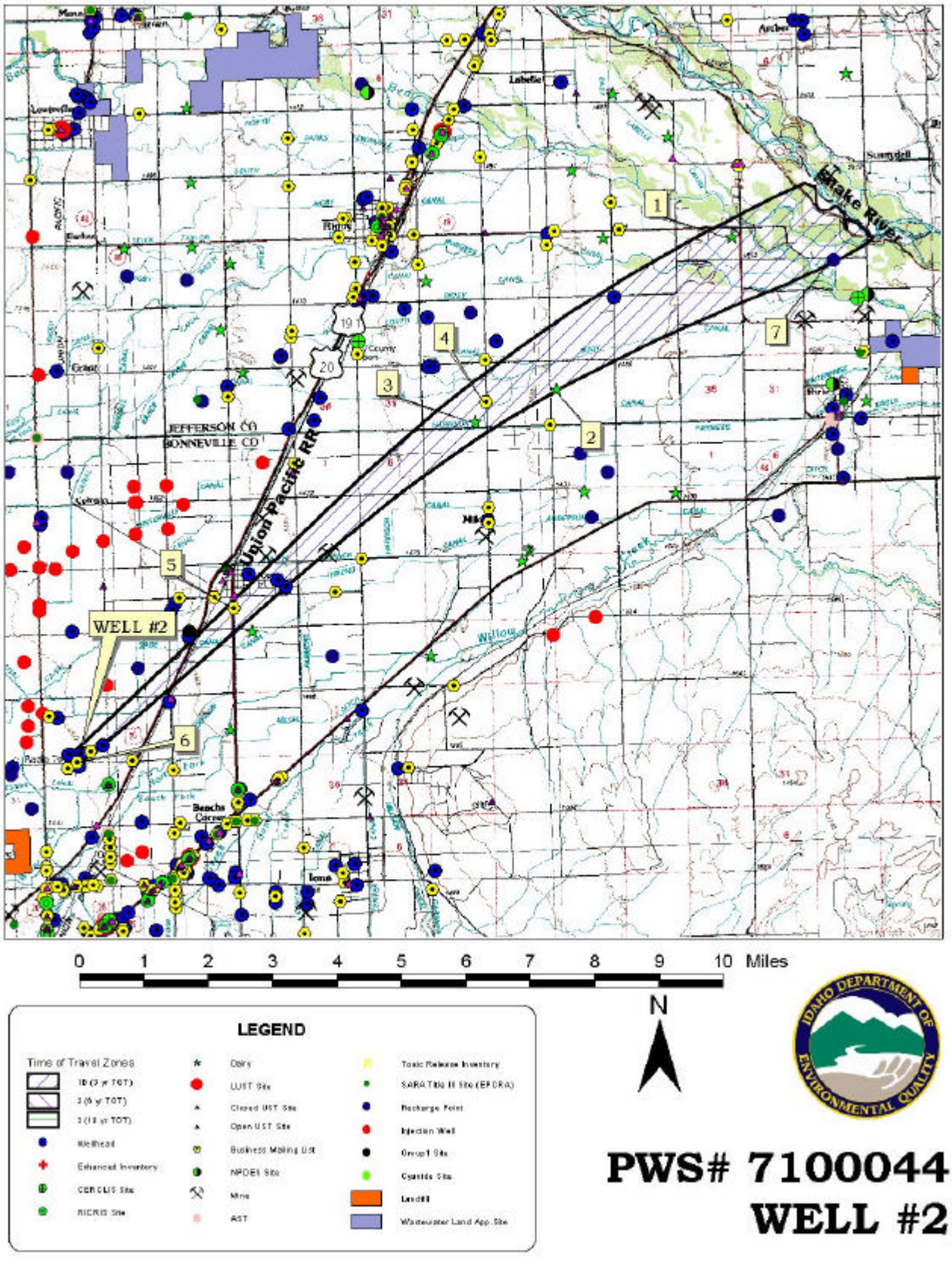

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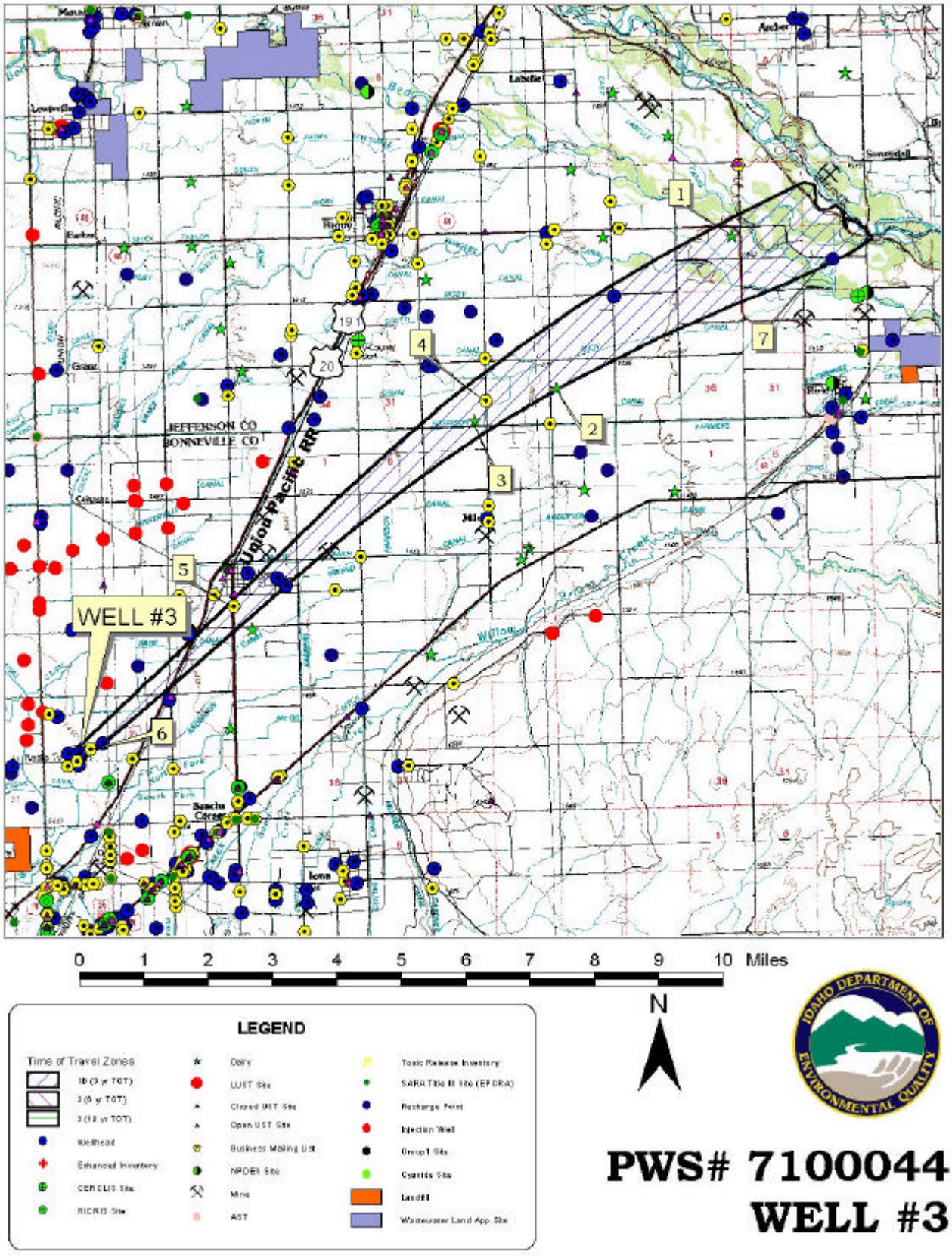

Table 2. J and K Water Corp. Wells #2 and #3, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	Dairy <=200 cows	0-3	Database Search	IOC, Microbes
2	Dairy <=200 cows	0-3	Database Search	IOC, Microbes
3	Dairy <=200 cows	0-3	Database Search	IOC, Microbes
4	Mobile Homes-Transporting	0-3	Database Search	IOC, VOC, SOC
5	Truck-Dealers-Used	0-3	Database Search	IOC, VOC, SOC
6	General Contractors	0-3	Database Search	IOC, VOC, SOC
7	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
	Highway 20	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3-10	GIS Map	IOC, VOC, SOC

[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was high for all three wells (see Table 3). This reflects the moderate to well-drained nature of the soil, a vadose zone composed of gravel and fractured basalt, a water table less than 300 feet below land surface, and the lack of thick fine-grained layers retarding the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The J and K Water Corp. drinking water system consists of three wells that extract ground water for community uses. Wells #2 and #3 rate moderate for system construction. Well #1 rates high. The 1998 Sanitary Survey found that all the wellheads and surface seals were maintained, however, well #1 was not protected from surface flooding. The Sanitary Survey recommended the installation of a fenced well lot around well #1 in order to protect it from the activity of grazing horses. The Sanitary Survey also noted that the fenced well lot around well #2 was within 20 feet of a livestock feeding operation.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thicknesses, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch diameter wells require a casing thickness of 0.322-inches and ten-inch diameter wells require a casing thickness of 0.365-inches. Pump tests for wells producing less than 50 gpm require a minimum of a 4-hour test and those producing greater than 50 gpm require a minimum of a 6-hour test. No pump test information was available for the three wells. All three wells were installed with 0.250-inch thick casing. Though the wells may have met well construction standards at the time they were built, none of them meet the current requirements.

Table 3. J and K Water Corp. Well Construction Summary Information

Well	Depth (ft)	Casing: diameter/ thickness (in)	Casing: depth (ft)/ formation	Water Table Depth (ft)	Surface seal: depth (ft)/ formation	Peak pumping rate (gpm) [1]	Drill Year
Well #1	186	8/.250	172/lava and cinders	138	19/lava	15	1972
Well #2	230	8/.250	173/broken basalt	121	173/broken basalt	15	1974
Well #3	285	10/.250	175/broken basalt	119	40/basalt	30	1986

[1] From WGI (2001) pumping rate data
NI = no information was available

Potential Contaminant Source and Land Use

Due to the presence of potential contaminant sources, much agricultural land with high county level nitrogen, herbicide, and total agricultural chemical usage, and the presence of two transportation corridors, all three wells rated high for IOCs (i.e. arsenic, nitrate), VOCs (i.e. petroleum products), and SOCs (i.e. herbicides), and moderate for microbial contaminants (i.e. bacteria). The delineations also cross an SOC priority area for the pesticide Atrazine.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. The presence of a potential source of contamination within a 50-foot radius of the well will also automatically give a high susceptibility rating to a well. Wells #1 and #2 automatically rate high for IOC and microbial contamination because they do not have the required 50-foot buffer, which would protect them from potential microbial contamination from animals grazing at or near the wellheads. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, all the wells rate high susceptibility for all categories of contamination, except for Well #2 which rates moderate for VOCs (see Table 3 and Attachment A).

Table 4. Summary of the J and K Water Corp. Susceptibility Evaluation

Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	H	H	H	M	H	H(*)[2]	H	H	H(*)
Well #2	H	H	H	H	M	M	H(*)[2]	M	H	H(*)
Well #3	H	H	H	H	M	M	H	H	H	H

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2]H(*) = Well rated high and automatically high because of potential IOCs and microbial sources within 50 feet of the wellhead.

Susceptibility Summary

Potential contaminant sources are present in the delineated source water assessment areas for all three wells. Countywide agricultural chemical use is considered high in this area and an SOC priority area for the pesticide Atrazine crosses all three delineations. Additionally, a large percentage of land in the source water assessment area is designated as irrigated agricultural land. The hydrologic sensitivity was high for the wells due to the nature of the fractured basalt that allows for contaminants to penetrate deep into the system.

Despite the moderate and high susceptibility ratings for the J and K Water Corp. wells, the system continues to provide high quality water to its customers. There has never been a VOC, SOC, or

microbial detection in the sampled well water. The IOCs arsenic and fluoride are present at levels far below the current MCLs, and may be naturally occurring in the formations in which the wells were developed. Nitrate concentrations detected in well water samples have consistently been less than 2.1 mg/L. Despite the high quality of water currently being provided, the J and K Water Corp. should be aware of the possibility of future contamination from potential contaminant sources and from continued agricultural practices.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the J and K Water Corp., source water protection activities should first focus on correcting any deficiencies outlined in the Sanitary Survey. Any spills from the potential contaminant sources listed in Appendix A should be carefully monitored, as should any future development in the delineated source water areas. Since all the sources show a connection with the Snake River, any major contamination of the river from one time events or floods should be monitored. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Since wells #1 and #2 do not contain the required 50-foot buffer from potential contamination, the J and K Water Corp. could consider obtaining the necessary 50-foot, fenced buffer for these wells. Any new PWS well should meet the *Recommended Standards for Water Works* (1997) as outlined in IDAPA 37.03.09 and IDAPA 58.01.08.550. Since most of the designated areas are outside the direct jurisdiction of the J and K Water Corp., partnerships with state and local agencies and industry groups should be established. These collaboration efforts are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation borders a large urban area. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineations, the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

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POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

Attachment A

J and K Water Corp.
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.273)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : J AND K WATER CORP Well# : WELL #1

Public Water System Number 7100044 10/17/2001 11:14:58 AM

1. System Construction		SCORE				
Drill Date	08/24/1972					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1998				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	NO	1				
Total System Construction Score		5				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
Total Hydrologic Score		6				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	YES	2	0	2		
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	YES	
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	6	6	6	4	
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8	
Sources of Class II or III leacheable contaminants or	YES	8	4	2		
4 Points Maximum		4	4	2		
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0	
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4	
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	16	12	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Land Use Zone II		0	0	0		
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0		
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0	
Cumulative Potential Contaminant / Land Use Score		25	23	25	14	
4. Final Susceptibility Source Score		16	16	16	16	
5. Final Well Ranking		High	High	High	High	

Ground Water Susceptibility Report Public Water System Name : J AND K WATER CORP Well# : WELL #2

Public Water System Number 7100044 10/17/2001 11:15:09 AM

1. System Construction		SCORE				
Drill Date	07/03/1974					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1998				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	YES	0				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		2				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
Total Hydrologic Score		6				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	YES	2	0	2		
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	YES	
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	9	6	6	5	
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8	
Sources of Class II or III leacheable contaminants or	YES	9	2	2		
4 Points Maximum		4	2	2		
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0	
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4	
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	14	16	12	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Land Use Zone II		0	0	0		
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0		
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0	
Cumulative Potential Contaminant / Land Use Score		25	21	25	14	
4. Final Susceptibility Source Score		13	12	13	13	
5. Final Well Ranking		High	Moderate	High	High	

Ground Water Susceptibility Report Public Water System Name : J AND K WATER CORP Well# : WELL #3

Public Water System Number 7100044 10/17/2001 11:15:21 AM

1. System Construction		SCORE				
Drill Date	10/09/1986					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1998				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		4				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
Total Hydrologic Score		6				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	YES	2	0	2		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	9	6	6	5	
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8	
Sources of Class II or III leacheable contaminants or	YES	9	2	2		
4 Points Maximum		4	2	2		
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0	
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4	
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	14	16	12	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Land Use Zone II		0	0	0		
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0		
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0	
Cumulative Potential Contaminant / Land Use Score		25	21	25	14	
4. Final Susceptibility Source Score		15	14	15	15	
5. Final Well Ranking		High	High	High	High	